



UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/658,784	09/11/00	RAAIJMAKERS	ASMEX.236A

020995 IM62/0605
KNOBBE MARTENS OLSON & BEAR LLP
620 NEWPORT CENTER DRIVE
SIXTEENTH FLOOR
NEWPORT BEACH CA 92660

EXAMINER	
ZERVIGON, R	
ART UNIT	PAPER NUMBER
1763	5

DATE MAILED: 06/05/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/658,784

Applicant(s)
Raaijmakers et al

Examiner
Rudy Zervigon

Art Unit
1763



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on Mar 23, 2001

2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-65 is/are pending in the application.

4a) Of the above, claim(s) 23-56 is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-18, 20, 21, 57-60, and 65 is/are rejected.

7) ☒ Claim(s) 19, 22, and 61-64 is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on Sep 11, 2000 is/are objected to by the Examiner.

11) ☒ The proposed drawing correction filed on Jan 11, 2001 is: a) ☒ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

19) ☐ Notice of Informal Patent Application (PTO-152)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2

20) ☐ Other:

Art Unit: 1763

DETAILED ACTION

Election/Restriction

1. Applicant's election of Group 1, claims 1-22, and 57-65 in Paper No. 4 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Drawings

2. The drawings of Figures 2A, 3B, and 4 are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "first port and a second port" must be shown or the features canceled from the claims. No new matter should be entered.
3. The drawings of Figures 3A, 3B, and 5 are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "wafer carrier" must be shown or the features canceled from the claims. No new matter should be entered.

Art Unit: 1763

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 recites "...a second elevator plate configured such that the elevator plate...". It is unclear whether the "elevator plate" referred to is the "elevator plate" of claim 1 or the "second elevator plate".

5. Claims 2, 11 recites the limitation "first portion." in claim 2. There is insufficient antecedent basis for this limitation in the claim.

6. Claims 2, 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 recites "first portion". The closest relationship with a "first portion" is the "first housing portion". This is assumed throughout the action.

Art Unit: 1763

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-11, 18, 20, 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Joe Wytman (EP0834907A2). Joe Wytman describes:

- i. 1. A load lock (item 10, Figures 1-3; column 6, lines 12-23) that defines at least partially a first chamber (item 14, Figures 1-3; column 6, lines 12-23) and an auxiliary chamber (item 30/12, Figures 1-3; column 7, lines 17-50), the load lock (item 10, Figures 1-3; column 6, lines 12-23) comprising:
 - ii. a first port (item 18, Figures 1-3; column 6, lines 8-10) and a second port (item 16, Figures 1-3; column 6, lines 1-6), the first and second ports for moving a wafer into and out of the load lock (item 10, Figures 1-3; column 6, lines 12-23); an elevator plate (item 22, Figures 1-3; column 6, lines 12-23) (item 22, Figures 1-3; column 6, lines 12-23) including a wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) that is adapted for receiving a plurality of wafers (items W, Figures 1-3; column 5, lines 54-58); and the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) being moveable (items 26, 28; Figures 1-3; column 6, lines 24-42) between a first position (Figure 3) where the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) is in the first chamber (item 14, Figures 1-3; column 6, lines 12-23) and a second

Art Unit: 1763

- position (Figure 2) where the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) is in the auxiliary chamber (item 30/12, Figures 1-3; column 7, lines 17-50) and the elevator plate (item 22, Figures 1-3; column 6, lines 12-23) substantially seals (items 32, 24; Figures 1-3; column 7, lines 17-50) the auxiliary chamber (item 30/12, Figures 1-3; column 7, lines 17-50) from the first chamber (item 14, Figures 1-3; column 6, lines 12-23).
- iii. 2. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 1, wherein the load lock (item 10, Figures 1-3; column 6, lines 12-23) is formed at least in part by a first housing portion (item 14, Fig. 1-3; column 6, lines 12-23) and an auxiliary (item 30/12, Figures 1-3; column 7, lines 17-50) housing portion that is removably (26, 28, 34; Fig. 1-3; column 6, lines 24-42, column 7, lines 25-30) coupled to the first portion (item 14, Fig. 1-3; column 6, lines 12-23).
- iv. 3. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 1, wherein the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) is adapted for receiving only a pair of wafers (items W, Figures 1-3; column 5, lines 54-58).
- v. 4. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 1, wherein the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) includes at least an unload position (Figure 2) and a load position (Figure 3).
- vi. 5. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 1, wherein the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) is located on top of the elevator plate (item 22, Figures 1-3; column 6, lines 12-23).

Art Unit: 1763

- vii. 6. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 5, wherein the elevator plate (item 22, Figures 1-3; column 6, lines 12-23) is configured to move vertically (items 26, 28; Figures 1-3; column 6, lines 24-42) in the load lock (item 10, Figures 1-3; column 6, lines 12-23).
- viii. 7. A load lock (item 10, Figures 1-3; column 6, lines 12-23) port as set forth in Claim 1, wherein the first and second ports open into the first chamber (item 14, Figures 1-3; column 6, lines 12-23).
- ix. 8. A load lock (item 10, Figures 1-3; column 6, lines 12-23) port as set forth in Claim 7, wherein the load lock (item 10, Figures 1-3; column 6, lines 12-23) comprises a first housing portion (item 14, Fig. 1-3; column 6, lines 12-23) and an auxiliary (item 30/12, Figures 1-3; column 7, lines 17-50) housing portion that at least partially defines (see common wall, Fig. 1-3) the auxiliary chamber (item 30/12, Figures 1-3; column 7, lines 17-50), the first and second ports being located on the first housing portion (item 14, Fig. 1-3; column 6, lines 12-23).
- x. 9. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 1, wherein the first port (item 18, Figures 1-3; column 6, lines 8-10) opens into the first chamber (item 14, Figures 1-3; column 6, lines 12-23) and the second port (item 16, Figures 1-3; column 6, lines 1-6) opens into the auxiliary chamber (item 30/12, Figures 1-3; column 7, lines 17-50).
- xi. 10. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 9, wherein the first port (item 18, Figures 1-3; column 6, lines 8-10) communicates with a wafer handling module (item 102, Fig. 1-3; column 9, lines 19-47).

Art Unit: 1763

- xii. 11. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 10, wherein the load lock (item 10, Figures 1-3; column 6, lines 12-23) comprises a first housing portion (item 14, Fig. 1-3; column 6, lines 12-23) and an auxiliary (item 30/12, Figures 1-3; column 7, lines 17-50) housing portion, the first port (item 18, Figures 1-3; column 6, lines 8-10) being located on the first ~~portion~~^{housing} (item 14, Fig. 13; column 6, lines 12-23) and the second port (item 16, Figures 1-3; column 6, lines 1-6) being located on the auxiliary (item 30/12, Figures 1-3; column 7, lines 17-50) housing portion.
- xiii. 18. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 1, wherein the auxiliary chamber (item 30/12, Figures 1-3; column 7, lines 17-50) includes inner walls (volume enclosing item 30) that are adapted to withstand an auxiliary fluid (column 7, lines 51-58).
- xiv. 20. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 1, wherein the load lock (item 10, Figures 1-3; column 6, lines 12-23) further includes heating elements (item 47, Figure 1; column 7, lines 54-55).
- xv. 21. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 20, wherein the heating elements (item 47, Figure 1; column 7, lines 54-55) are located within the auxiliary chamber (item 30/12, Figures 1-3; column 7, lines 17-50).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1763

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 12-17, 57-60, and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joe Wytman (EP0834907A2), as applied to claims 1-11, 18, 20, 21 above. Joe Wytman describes:

xvi. 13. A load lock (item 10, Figures 1-3; column 6, lines 12-23) port as set forth in Claim 12, wherein the load lock (item 10, Figures 1-3; column 6, lines 12-23) comprises a first housing portion (item 14, Fig. 1-3; column 6, lines 12-23) and an auxiliary (item 30/12, Figures 1-3; column 7, lines 17-50) housing portion, the first port (item 18, Figures 1-3; column 6, lines 8-10) being located on the first housing portion (item 14, Fig. 1-3; column 6, lines 12-23) and the second port (item 16, Figures 1-3; column 6, lines 1-6) being located on the auxiliary (item 30/12, Figures 1-3; column 7, lines 17-50) housing portion.

xvii. 57. A system for processing substrates (items W, Figures 1-3; column 5, lines 54-58), comprising a load lock chamber (item 10, Figures 1-3; column 6, lines 12-23) including a lower portion (item 14, Figures 1-3; column 6, lines 12-23) ^{attached to the lower portion and} having a first inner width and an upper portion (item 30/12, Figures 1-3; column 7, lines 17-50) having a narrower second inner width (Figures 1-3, where 47's rest), the chamber including a first port (item 18, Figures 1-3; column 6, lines 8-10) and a second port (item 16, Figures 1-3; column 6, lines 1-6), each of the ports sized to pass substrates (items W, Figures 1-3; column 5, lines 54-58) therethrough, the load lock chamber (item 10, Figures 1-3; column 6, lines 12-23) further comprising a moveable (items 26, 28; Figures 1-3; column 6, lines 24-42) platform (item 22, Figures 1-3;

Art Unit: 1763

- column 6, lines 12-23) configured to support at least one substrate thereon and sized to have a width (Figures 1-3) less than the first inner width (Figures 1-3) and greater than the second inner width (Figures 1-3, where 47's rest) to enable selectively sealing the upper portion (item 30/12, Figures 1-3; column 7, lines 17-50) with the at least one substrate supported thereon;
- xviii. 59. The system of Claim 58, wherein the first port (item 18, Figures 1-3; column 6, lines 8-10) is located in the lower portion (item 14, Figures 1-3; column 6, lines 12-23).
- xix. 60. The system of Claim 59, wherein the second port (item 16, Figures 1-3; column 6, lines 1-6) is located in the lower portion (item 14, Figures 1-3; column 6, lines 12-23).
- xx. 65. The system of Claim 57, wherein the moveable (items 26, 28; Figures 1-3; column 6, lines 24-42) platform (item 22, Figures 1-3; column 6, lines 12-23) includes two shelves for supporting substrates (items W, Figures 1-3; column 5, lines 54-58).
- xxi. 17. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 14, wherein the second port (item 16, Figures 1-3; column 6, lines 1-6) opens into the first chamber (item 14, Figures 1-3; column 6, lines 12-23).

However, Joe Wytman does not describe the underlined text:

- xxii. a substrate handling chamber (item 100, Figure 1) selectively communicating with the load lock chamber (item 10, Figures 1-3; column 6, lines 12-23) through the first port (item 18, Figures 1-3; column 6, lines 8-10); and at least one process chamber selectively communicating with the substrate handling chamber (item 100, Figure 1).

Art Unit: 1763

- xxiii. 58. The system of Claim 57, wherein the load lock chamber (item 10, Figures 1-3; column 6, lines 12-23) selectively communicates with a clean room environment through the second port (item 16, Figures 1-3; column 6, lines 1-6).
- xxiv. 12. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 9, wherein the second port (item 16, Figures 1-3; column 6, lines 1-6) communicates with a wafer handling module (item 102, Fig. 1-3; column 9, lines 19-47).
- xxv. 14. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 1, wherein the first port (item 18, Figures 1-3; column 6, lines 8-10) is configured to receive the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) and the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) being moveable (items 26, 28; Figures 1-3; column 6, lines 24-42) between an outside position where the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) is outside the load lock (item 10, Figures 1-3; column 6, lines 12-23) and an inside position wherein the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) is inside the load lock (item 10, Figures 1-3; column 6, lines 12-23).
- xxvi. 15. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 14, wherein the load lock (item 10, Figures 1-3; column 6, lines 12-23) further includes a second elevator plate (item 22, Figures 1-3; column 6, lines 12-23) configured such that the elevator plate (item 22, Figures 1-3; column 6, lines 12-23) substantially closes the first port (item 18, Figures 1-3; column 6, lines 8-10) when the wafer carrier (item 11, Figures 1-3; column 6, lines 1-11) is in the inside position.

Art Unit: 1763

xxvii. 16. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 14, wherein the second port (item 16, Figures 1-3; column 6, lines 1-6) opens into the auxiliary chamber (item 30/12, Figures 1-3; column 7, lines 17-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made, to selectively communicate at least one process chamber with the substrate handling chamber (item 100, Figure 1).

Motivation for selectively communicating at least one process chamber or clean room with the substrate handling chamber (item 100, Figure 1) is drawn from the level of ordinary skill in the art and is discussed by Joe Wytman (column 1, lines 13-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to enlarge the dimensions of the first port (item 18, Figures 1-3; column 6, lines 8-10) so that it is configured to receive the wafer carrier.

Motivation for enlarging the dimensions of the first port (item 18, Figures 1-3; column 6, lines 8-10) so that it is configured to receive the wafer carrier is drawn from the level of ordinary skill whereby moving the wafer carrier among chambers as opposed to the wafers themselves provides for contact free processing of the wafers and the wafer handling module (item 102, Fig. 1-3; column 9, lines 19-47).

Art Unit: 1763

Allowable Subject Matter

11. Claims 19, 22, and 61-64 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

xxviii. 19. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 18, wherein the auxiliary fluid comprises HF vapor. *✓ App. lim.*

xxix. 22. A load lock (item 10, Figures 1-3; column 6, lines 12-23) as set forth in Claim 20, wherein the heating elements (item 47, Figure 1; column 7, lines 54-55) are located upon the elevator plate (item 22, Figures 1-3; column 6, lines 12-23).

xxx. 61. The system of Claim 57, wherein the first port (item 18, Figures 1-3; column 6, lines 8-10) is located in the upper portion (item 30/12, Figures 1-3; column 7, lines 17-50). *✓ App. lim.*

xxxi. 62. The system of Claim 57, wherein the upper portion (item 30/12, Figures 1-3; column 7, lines 17-50) includes treatment gas injectors. *✓ App. lim.*

xxxii. 63. The system of Claim 62, wherein the treatment gas injectors communicate with a source of HF vapor.

xxxiii. 64. The system of Claim 62, wherein the treatment gas injectors communicate with an oxidant source.

1
18
└ 19

20
└ 22


57
└ 61
└ 62-64
└ 63

Art Unit: 1763

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S.Pat. 6,048,154; 5,586,585; 5,630,690; 5,538,390; 5,391,035; 5,683,072; 5,520,743; 6,022,586; 6,074,538

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 305-3599. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.


MARIAN C. KNODE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700